

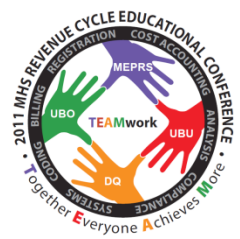
Title: **Anatomy and Terminology II - Bones**

Session: **M-6-1430**



Objectives

- Recall all those pesky bones
 - What they do
 - Where they are
 - How they connect
- Thank you very much to Wikipedia for the Grey's Anatomy pictures



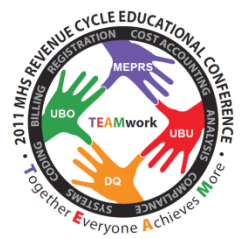
How the Class Will Work

- Pre-quiz
- Look at the pretty pictures while I drone on
- Post quiz

Musculoskeletal Pre-quiz

- 12 Coronoid process
 - 25 ????
 - 26 Intercondylar fossa
 - 30 Olecranon
 - 31 Olecranon fossa
 - 34 ??? head
 - 35 ??? neck
 - 47 Trochlear notch of
 - 50 ??? tuberosity
-
- 25 _____
 - 34 _____ head
 - 35 _____ neck
 - 47 Trochlear notch of
 - 50 _____ tuberosity





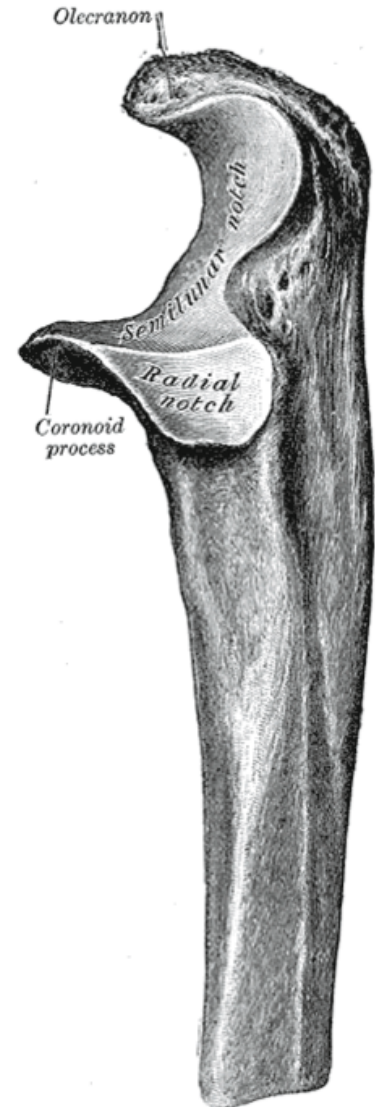
Goals

- When given a list of anatomical and other medical terms, match to the correct definition 80% of the time
- When given a list of definitions, match the definition to the correct anatomical or other medical term 80% of the time
- Understand that the transition to ICD-10-PCS will make hospital procedure coding easier and the data much more useful

What Do Bones Bo?

Coronoid Process of the Ulna

- This is the proximal end of the ulna where it articulates with the humerus and the radius
- Excellent example of one of the reasons for bones – movement
- Why are bones all knobby instead of smooth?

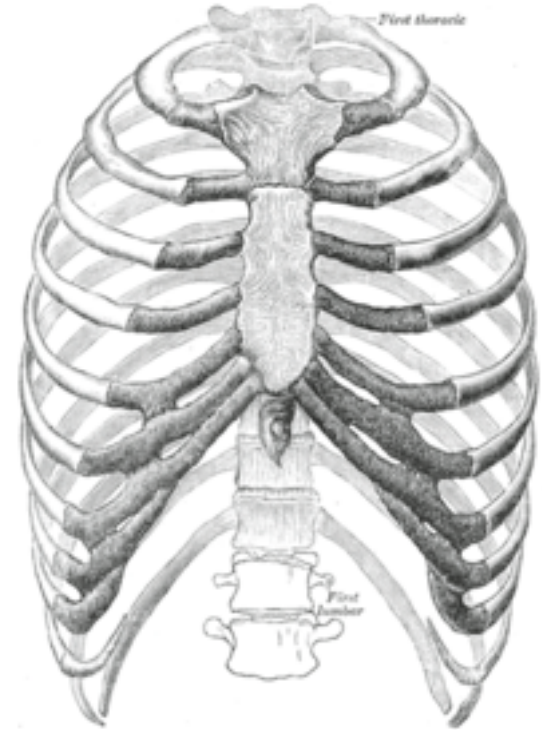


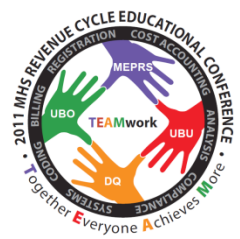
What Do Bones Bo?

Ribs

- Excellent example of two of the reasons for bones:

SUPPORT
PROTECTION

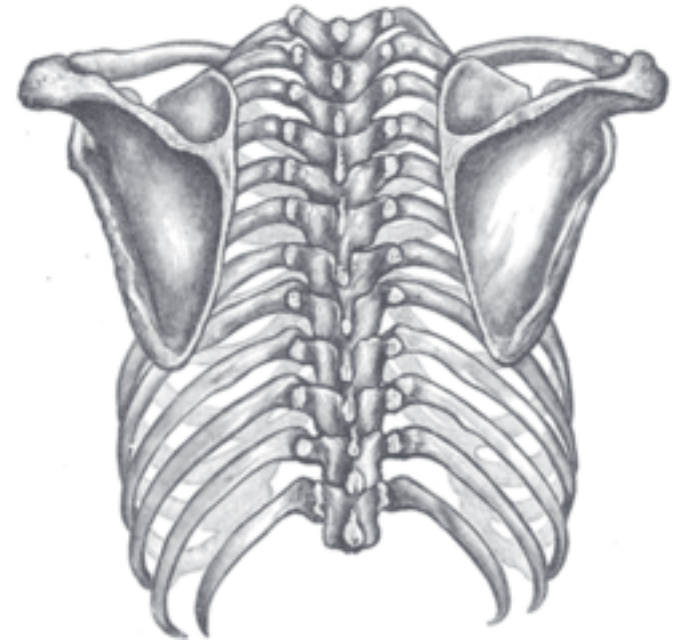




What Do Bones Bo?

Bone Marrow

- Excellent example of one reason for bones: **Marrow produces new blood cells**
red blood cells
platelets
most white blood



What Do Bones Bo?

Ethmoid Bone

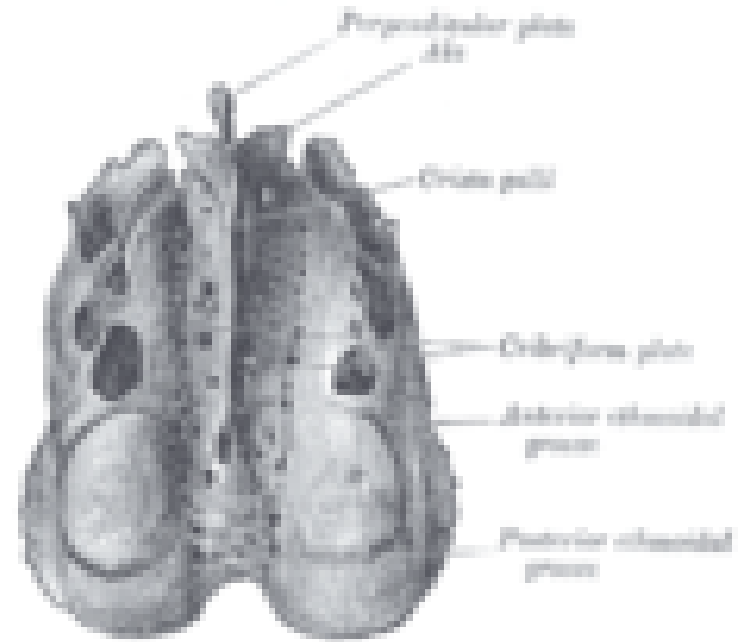
- Excellent example of one reason for bones:

Organization

meatus

foramen

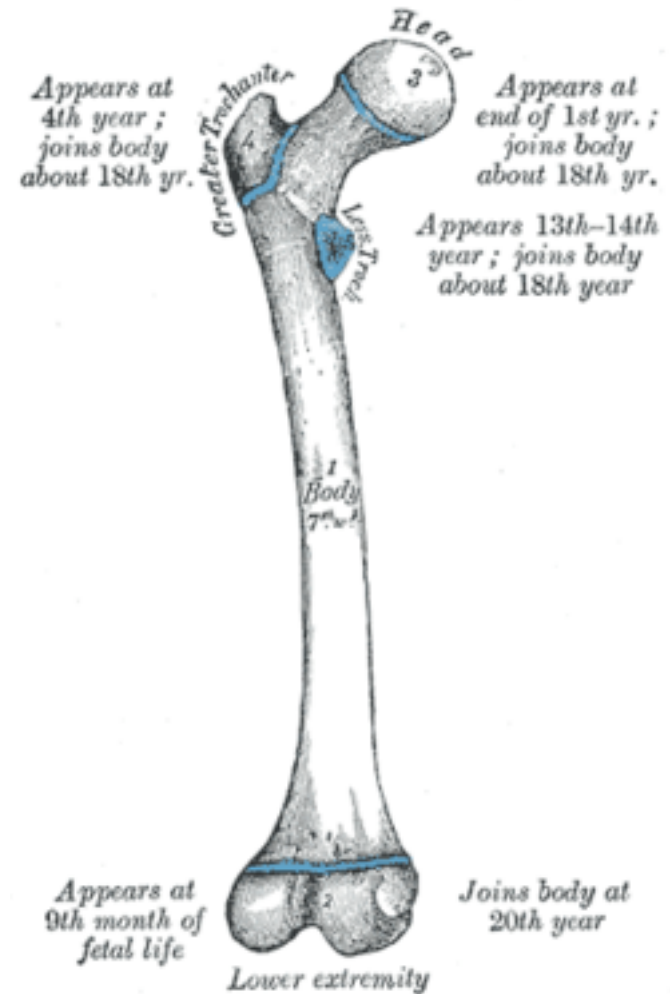
canal

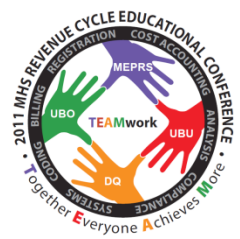


What Do Bones Bo?

Femur (thigh bone)

- Excellent example of one reason for bones – Store calcium and phosphorus

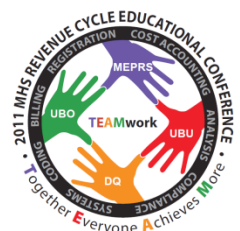




What Are the Bones and Terms Associated with Them?

- Atlas of the Human Skeleton (AHS), page 2
- Brief Atlas of the Skeleton (BAS), page 3

TERM	Example	DEFINITION
anterior	anterior view	front
superior	superior orbital fissure	situated above
inferior	inferior orbital fissure	situated below
suture	sagittal suture	fibrous joint with opposed surfaces closely united
sagittal	sagittal suture	shaped like an arrow; straight; anteriorposterior plane or section parallel to the median plane of the body
plate	perpendicular plate	a flat suture or layer, such as a thin layer of bone
foramen	optic foramen	a natural opening or passage, especially one into or through a bone
concha	nasal concha	shell; superior (or supreme), media (or middle), inferior
turbinate	nasal turbinate	shaped like a top (same as concha for nasal)
margin	supraorbital margin	edge or border; boundary of an organ
fissure	superior orbital fissure	a cleft or groove; especially a deep fold in the cerebral cortex



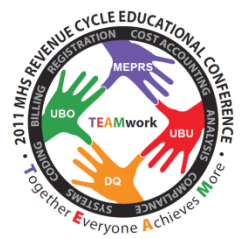
What Are the Bones and Terms Associated with Them?

Skull, right lateral view

- Atlas of the Human Skeleton (AHS), page 2
- Brief Atlas of the Skeleton (BAS), page 3

TERM	Example: Skull, R lateral	DEFINITION
mental	mental foramen	pertaining to the chin
process	mastoid process	a prominence or projection, as of bone
meatus	external auditory meatus	an opening or passage
external	external auditory meatus	outside
lacrimal	lacrimal bone	pertaining to tears
temporal	temporal process of zygomatic bone	pertaining to the lateral region of the head, above the zygomatic arch

What are the three bones that are inside the “internal auditory (acoustic) meatus? In ICD-10-PCS, they are considered auditory ossicles.

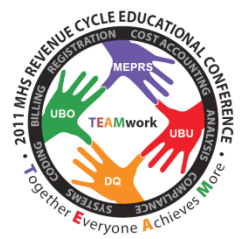


What Are the Bones and Terms Associated with Them?

Skull, medial view of sagittal section

- Atlas of the Human Skeleton (AHS), page 3
- Brief Atlas of the Skeleton (BAS), page 4

TERM	Example: skull, medial	DEFINITION
protuberance	external occipital protuberance	thrust forward or laterally
hypoglossal	hypoglossal canal	hypo =under; glossal=tongue
canal	hypoglossal canal	narrow tubular passage or channel
condyle	occipital condyle	rounded projection on a bone
fossa	hypophyseal fossa	trench or channel; general term for a hollow or depressed area
sinus	frontal sinus	a cavity; paranasal sinuses - ethmoid, frontal, maxillary, sphenoidal



What Are the Bones and Terms Associated with Them?

Skull, posterior view Skull, superior view

- Atlas of the Human Skeleton (AHS), page 4
- Brief Atlas of the Skeleton (BAS), page 5

TERM	Example: skull, posterior	DEFINITION
frontal	frontal bone	from coronal suture to orbits (forehead)
parietal	parietal bone	from coronal to sagittal to lambdoid to temporal sutures (top middle skull)
occipital	occipital bone	separated from parietal and temporal by lambdoid suture (back lower skull)
lambdoid	lamdoid suture	shaped like the Greek letter Λ (lambda)

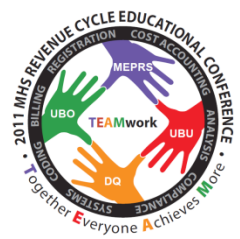


What Are the Bones and Terms Associated with Them?

Skull, inferior view, teeth

- Atlas of the Human Skeleton (AHS), page 5
- Brief Atlas of the Skeleton (BAS), page 6

TERM	Example: skull, inferior	DEFINITION
tooth	impacted tooth	small hard structures in the jaws used for mastication of food
edentulous	edentulous; soft food diet	without teeth
incisor	incisor teeth	4 front teeth, 2 on each side of midline
canine	canine teeth	teeth immediately lateral to the second incisor; most powerful root of all the teeth
premolar	premolar	8 permanent teeth, 2 on either side of jaw, between canine and molar; upper have 2 cusps, lower have 1-3 cusps
molar	molar teeth	most posterior on each side of jaw, 8 in deciduous (2 on each side, upper and lower) and 12 in permanent; grinding teeth with large crowns
deciduous	deciduous teeth	teeth of first dentition, which are shed; called milk, primary or temporary teeth
vital	vital teeth	nerve and vascular supply is intact

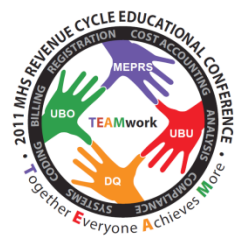


What Are the Bones and Terms Associated with Them?

Skull, inferior view, foramen

- Atlas of the Human Skeleton (AHS), page 5
- Brief Atlas of the Skeleton (BAS), page 6

Foramen	Used for:
incisive foramen	nasopalatine nerve
foramen ovale	mandibular branch of the trigeminal nerve and some vessels
foramen spinosum	middle meningeal artery
caroid foramen	carotid vessels
jugular foramen	various venins, arteries, and nerves
foramen lacerum	internal carotid artery
foramen magnum	vertebral canal
mastoid foramen	artery and veins
mental foramen	mental nerve and vessels



What Are the Bones and Terms Associated with Them?

Floor of cranium, superior view

- Atlas of the Human Skeleton (AHS), page 6
- Brief Atlas of the Skeleton (BAS), page 7

TERM	Example: floor of cranium	DEFINITION
crista	crista galli	projection or ridge; a thick triangular process projecting upward from the cribriform plate
cribriform plate	cribriform	perforated with small apertures like a sieve; olfactory cell fibers pass through the cribriform plate between the mouth and the olfactory bulb
optic	optic foramen	eye; opening for the optic nerves and vessels



What Are the Bones and Terms Associated with Them?

Sphenoid bone; superior, anterior, inferior

- Atlas of the Human Skeleton (AHS), page 7
- Brief Atlas of the Skeleton (BAS), page 8
- Has one of the 4 paired paranasal sinuses
- Along with the ethmoid, pretty much is the organizer for vessels and cranial nerves



What Are the Bones and Terms Associated with Them?

Ethmoid bone

- Atlas of the Human Skeleton (AHS), page 8
- Brief Atlas of the Skeleton (BAS), page 9
- Has one of the 4 paired paranasal sinuses
- Along with the sphenoid, pretty much is the organizer for vessels and cranial nerves



What Are the Bones and Terms Associated with Them?

Right orbit, anterior view

- Atlas of the Human Skeleton (AHS), page 9
- Brief Atlas of the Skeleton (BAS), page 10

TERM	Example: orbit	DEFINITION
margin	supraorbital margin	edge or border; boundry of an organ
infraorbital	infraorbital foramen	infra=situated, formed, or occurring beneath the element indicated by the word stem; orbit=bony cavity containing the eyeball
arch, maxillary	superior dental arch	maxillary teeth in their normal position forming an arch from one ear to the other ear
arch, mandibular	inferior dental arch	arch of the mandible

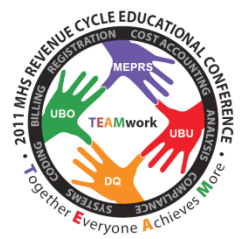


What Are the Bones and Terms Associated with Them?

Fetal skull, fontanel

- Atlas of the Human Skeleton (AHS), page 10
- Brief Atlas of the Skeleton (BAS), page 11

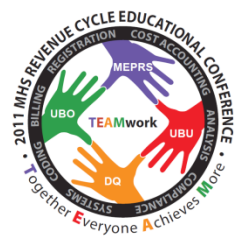
TERM	Example: fontanel	DEFINITION
fontanel	anterior fontanel	soft spot, such as one of the membrane-covered spaces remaining in the incompletely ossified skull of a fetus or infant
wormian	wormian bones	ossa auturarum; bones fused in the cranial sutures



What Are the Bones and Terms Associated with Them?

ICD-10-PCS terms

Bone, Ethmoid, Left Bone, Ethmoid, Right	Includes: Cribriform plate
Bone, Frontal, Left Bone, Frontal, Right	Includes: Zygomatic process of frontal bone
Bone, Nasal	Includes: Vomer
Bone, Occipital, Left Bone, Occipital, Right	Includes: Foramen magnum
Bone, Pelvic, Left Bone, Pelvic, Right	Includes: Iliac crest Ilium Ischium Pubis
Bone, Sphenoid, Left Bone, Sphenoid, Right	Includes: Greater wing Lesser wing Optic foramen Pterygoid process Sella turcica
Bone, Temporal, Left Bone, Temporal, Right	Includes: Mastoid process Petrous part of temporal bone Tympanic part of temporal bone Zygomatic process of temporal bone



What Are the Bones and Terms Associated with Them?

Vertebral column

- Atlas of the Human Skeleton (AHS), page 11
- Brief Atlas of the Skeleton (BAS), page 13

TERM	Example: vertebral column	DEFINITION
lordosis		anterior concavity in the curvature of the lumbar and cervical spine as viewed from the side (hollow back, saddleback, swayback)
scoliosis		appreciable lateral deviation in the normally straight vertical line of the spine
kyphosis		abnormally increased convexity in the curvature of the thoracic spine as viewed from the side; hunchback
facet	superior articular facet	facet—a small plane surface on a hard surface; articular f. —small plane surface on a bone at the site where it articulates with another structure
pedicle		footlike, stemlike, or narrow basal part of structure
lamina		a thin flat plate or layer
nucleus pulposus		semifluid mass of fine white and elastic fibers that forms the central portion of an intervertebral disk
anulus fibrosus		circumferential ringlike portion of an intervertebral disk, composed of fibrocartilage and fibrous tissue

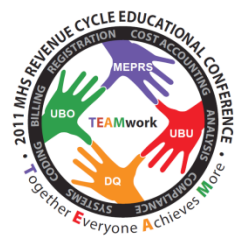


What Are the Bones and Terms Associated with Them?

Cervical vertebrae

- Atlas of the Human Skeleton (AHS), page 12
- Brief Atlas of the Skeleton (BAS), page 14

TERM	Example: cervical vertebrae	DEFINITION
atlas		the Greek god who bears up the pillars of Heaven; first cervical vertebra, which articulates above with the occipital bone and below with the axis
axis		line about which a revolving body turns; 2nd cervical vertebra; called also epistropheus, odontoid vertebra and vertebra dentata



What Are the Bones and Terms Associated with Them?

Lumbar vertebrae

- Atlas of the Human Skeleton (AHS), page 13
- Brief Atlas of the Skeleton (BAS), page 15

TERM	Example: lumbar vertebrae	DEFINITION
anterior approach		to work on body or nucleus pulposus, cervical-enter through neck avoiding esophagus;lumbar-enter through abdominal muscles
posterior approach		to work on lamina and facets, insert rods, to fuse
internal fixation		internally holding, suturing, or fastening in a fixed position
arthrodesis		arthro=joint + desis=bind; surgical fixation of a joint by a procedure designed to accomplish fusion of the joint surfaces by promoting the proliferation of bone cells
herniated disk		protrusion of the nucleus pulposus or anulus fibrosis of the disk which may impinge on nerve roots.
degenerative		change of tissue to a lower or less functional form

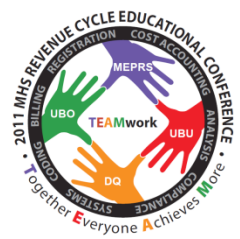


What Are the Bones and Terms Associated with Them?

Sacrum and coccyx

- Atlas of the Human Skeleton (AHS), page 14
- Brief Atlas of the Skeleton (BAS), page 16

TERM	Example: sacrum and coccyx	DEFINITION
ala	sacral ala	general term for winglike structure or process; wing
apex	apex of sacrum	top, pointed extremity of a conical structure; tip
tuberosity	sacral tuberosity	elevation or protuberance
cornu	sacral cornu	hornlike projection; horn; either of the hook-shaped processes extending downward from the arch of the last sacral vertebra; coccygeal eminence



What Are the Bones and Terms Associated with Them?

Thorax, anterior

- Atlas of the Human Skeleton (AHS), page 15
- Brief Atlas of the Skeleton (BAS), page 17

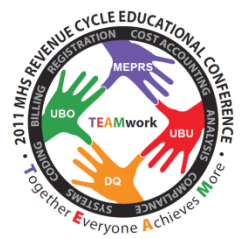
TERM	Example: thorax	DEFINITION
costal		24 ribs, male or female; 1 of 12 paired bones that extend from the thoracic vertebrae toward the median line on the ventral aspect of the trunk; rib
cartilage		
floating rib	#11 and 12	one of the lowest 2 ribs on either side, whose ventral tips ordinarily have no attachment; false ribs; costae fluctuans
true rib	#1-7	costae verae; upper seven ribs on either side which are connected to the sternum by their costal cartilages
costae spuriae	#8-10, #11-12	lower 5 ribs on either side: the ventral tips of the upper 3 of the 5 pairs connect with the costal cartilage of the superiorly adjacent ribs
xiphoid		distal process on the sternum
sternum		composed of manubrium, body and xiphoid



What Are the Bones and Terms Associated with Them?

Articulation, vertebra

- Atlas of the Human Skeleton (AHS), page 16
- Brief Atlas of the Skeleton (BAS), page 19
- Ribs articulate with the vertebral column
- Cartilage connects ribs 1-10 to the sternum
- Ribs 11 and 12 are “floating”

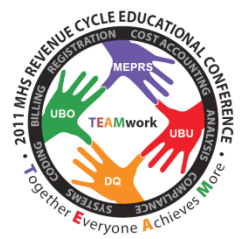


What Are the Bones and Terms Associated with Them?

Scapula

- Atlas of the Human Skeleton (AHS), page 17
- Brief Atlas of the Skeleton (BAS), page 19

TERM	DEFINITION
acromion	acro=top, extreme + omos=shoulder
clavicle	articulates with acromion process and sternum (the manubrium portion)
coracoid process	articulates with the head of the humerus; do not confuse with coronoid process of the ulna
glenoid cavity	resembling a pit or socket

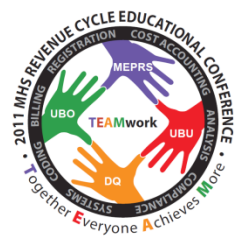


What Are the Bones and Terms Associated with Them?

Humerus

- Atlas of the Human Skeleton (AHS), page 18
- Brief Atlas of the Skeleton (BAS), page 20

TERM	Example: humerus	DEFINITION
neck	anatomical neck	neck=constricted portion, connecting head and body
sulcus	intertubercular sulcus	groove, trench or furrow
body		largest and most important part of an organ
olecranon fossa		socket for the olecranon of the ulna
epicondyle	lateral epicondyle	an eminence upon a bone, above its condyle (a rounded projection on a bone)
trochlea		pully shaped part or structure
capitulum		little head, applied to distal head of humerus as it already has a head

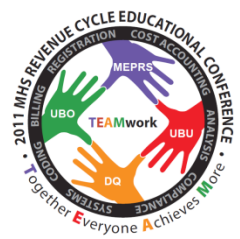


What Are the Bones and Terms Associated with Them?

Ulna and radius

- Atlas of the Human Skeleton (AHS), page 19
- Brief Atlas of the Skeleton (BAS), page 21

TERM	Example: radius and ulna	DEFINITION
nutrient foramen		opening for vessels to medulla ossium
medulla ossium	marrow	soft organic material that fills the cavities of the bones
olecranon		proximal bony projection of ulna that forms part of the trochlear notch
styloid	styloid process	resembling a pillar; long and pointed

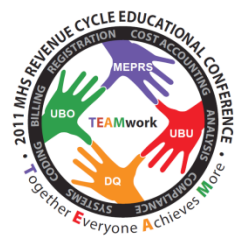


What Are the Bones and Terms Associated with Them?

Hand and wrist

- Atlas of the Human Skeleton (AHS), page 20
- Brief Atlas of the Skeleton (BAS), page 22

TERM	DEFINITION
carpals	scaphoid, trapezium, trapezoid; lunate; triquetrum; pisiform; capitate; hamate
metacarpals	bones of hand
phalanges	fingers and toes
proximal	nearest to body
distal	furthest from body



What Are the Bones and Terms Associated with Them?

Hip

- Atlas of the Human Skeleton (AHS), page 21
- Brief Atlas of the Skeleton (BAS), page 22

TERM	Example: hip	DEFINITION
ilium		ilium-"I am a bone" -- do not confuse with ileum-"exit, part of the intestine"; upper portion of pelvis
acetabulum		where head of the femer fits
obturator foramen		
ischium		lower back portion of pelvis
ramus	superior ramus of pubis	branch

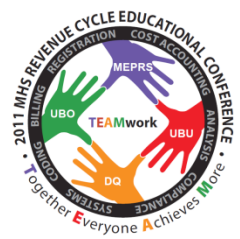


What Are the Bones and Terms Associated with Them?

Pelvis

- Atlas of the Human Skeleton (AHS), page 22
- Brief Atlas of the Skeleton (BAS), page 24

TERM	Example: pelvis	DEFINITION
false pelvis		pelvis major; part of the pelvis superior to a plane passing through the ileopectineal lines
true pelvis		pelvis minor; the part of the pelvis inferior to a plane passing through the iliopectineal lines
gynecoid	gynecoid pelvis	pelvis with rounded oval shape with well rounded anterior and posterior segment; it represents the normal female pelvis
android	android pelvis	pelvis characterized by a wedge-shaped inlet and a narrowness of the anterior segment



What Are the Bones and Terms Associated with Them?

Femur

- Atlas of the Human Skeleton (AHS), page 23
- Brief Atlas of the Skeleton (BAS), page 25
- Highly vascular

TERM	Example: femur	DEFINITION
trochanter	greater trochanter	a broad flat process at the upper end of the lateral surface of the femur, to which several muscles are attached

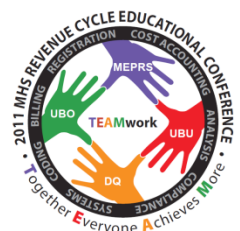


What Are the Bones and Terms Associated with Them?

Tibia and Fibula

- Atlas of the Human Skeleton (AHS), page 24
- Brief Atlas of the Skeleton (BAS), page 26

TERM	Example: tibia and fibula	DEFINITION
malleolus	medial malleolus	ankle bone: medial is on the tibia, lateral is on the fibula
bursa	patellar bursa, deep	sac or saclike cavity filled with a viscid fluid and situated at places in the tissues at which friction would otherwise develop
patella		knee cap

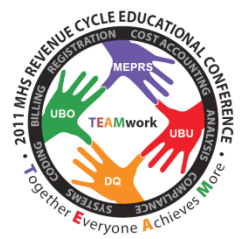


What Are the Bones and Terms Associated with Them?

Ankle and foot

- Atlas of the Human Skeleton (AHS), page 25

TERM	DEFINITION
tarsals	calcaneus, talus, cuboid, navicular, cuneiforms (lateral, intermediate, medial)
calcaneus	heel bone; os calcis
hallux	big toe; great toe
hallux malleus	hammer toe
hallux valgus	great toe away from midline
hallux varus	great toe toward midline, away from other toes
Achilles tendon	connects calcaneus to gastrocnemius to the popliteal surface of femur, upper part of medial condyle, and capsule of knee (plantar flexes ankle joint)
bunion	abnormal prominence of the inner aspect of the first metatarsal head, accompanied by bursal formation and resulting in a lateral or valgus displacement of the great toe

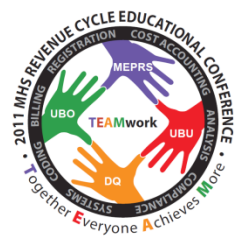


What Are the Bones and Terms Associated with Them?

Complete skeleton

- Atlas of the Human Skeleton (AHS), page 26
- Brief Atlas of the Skeleton (BAS), page 1
- Does more than provide attachment for tendons and ligaments permitting movement
- Stores calcium and phosphorus
- Marrow creates red blood cells
- Protects brain and lungs/heart
- Organizes where blood vessels and nerves enter various spaces

TERM	DEFINITION
skull	cranial portion and facial portion
pectoral girdle	clavicle and scapula
thorax	sternum and ribs
pelvic girdle	ilium, ishium, pubis (the back portion is the vertebral column to include the sacrum and coccyx)
extremities	arms and legs



Fractures

- Closed
- Open
- Causes
 - Impact
 - Bone weakness due to osteoporosis and cancer



Forearm (S52), Femur (S72), and Lower Leg (S82) Fractures in ICD-10-CM

- Gustilo
 - I – Low energy, wound less than 1 cm
 - II – Wound greater than 1 cm with moderate soft tissue damage
 - III – High energy wound greater than 1 cm with extensive soft tissue damage
 - IIIA Adequate soft tissue cover
 - IIIB Inadequate soft tissue cover
 - IIIC Associated with arterial injury

Musculoskeletal

- 12 Coronoid process
- 25 Humerus
- 26 Intercondylar fossa
- 30 Olecranon
- 31 Olecranon fossa
- 34 Radial head
- 35 Radial neck
- 47 Trochlear notch of ulna
- 50 Ulnar tuberosity





Questions?
